

WHAT IS CLAIMED IS:

1. A method to recover components of a sputter target assembly comprising a tantalum or niobium target bonded to a backing plate, wherein said method comprising
hydriding said tantalum or niobium target to form tantalum hydride or
5 niobium hydride, respectively; and
separating said tantalum hydride or niobium hydride from said backing plate.
2. The method of claim 1, wherein said tantalum or niobium target is an eroded tantalum or niobium target.
3. The method of claim 1, wherein said tantalum or niobium target is a tantalum
10 alloy or niobium alloy target.
4. The method of claim 1, wherein said tantalum or niobium target is an uneroded tantalum or niobium target.
5. The method of claim 1, further comprising converting said tantalum hydride or niobium hydride to tantalum or niobium, respectively, after said separating.
- 15 6. The method of claim 1, further comprising first reducing said tantalum hydride or niobium hydride to a powder and then converting said tantalum hydride or niobium hydride powder to a tantalum or niobium powder, respectively.
7. The method of claim 1, further comprising recovering said backing plate separated from said tantalum hydride or niobium hydride.
- 20 8. The method of claim 7, wherein said backing plate is cleaned, polished, or both.
9. The method of claim 5, wherein said converting comprises heating said tantalum hydride or niobium hydride under vacuum at a sufficient temperature and time to convert said tantalum hydride or niobium hydride to tantalum or niobium, respectively.

10. The method of claim 9, wherein said heating is at a temperature of from about 800° C to about 1000° C.
11. The method of claim 9, wherein said heating occurs at a temperature of about 850° C.
- 5 12. The method of claim 1, wherein said separating is achieved by mechanical means.
13. The method of claim 1, wherein said separating is achieved by scraping, grinding, grit blasting, or combinations thereof.
14. The method of claim 5, wherein said tantalum or niobium is melted into an
10 ingot.
15. A sputter target comprising tantalum hydride or niobium hydride located onto a backing plate.
16. The sputter target of claim 15, wherein said sputter target is an eroded sputter target.
- 15 17. The sputter target of claim 15, wherein said backing plate comprises copper, aluminum, or alloys thereof.
18. The method of claim 1, wherein said backing plate comprises copper, aluminum, or alloys thereof.
19. The method of claim 1, wherein said tantalum or niobium target is bonded to
20 a backing plate by diffusion bonding, explosion bonding, electron beam welding, inertia welding, or combinations thereof.
20. The sputter target of claim 15, wherein said backing plate is bonded onto said tantalum hydride or niobium hydride by diffusion bonding, explosion bonding, electron beam welding, inertia welding, or combinations thereof.

21. The sputter target of claim 15, wherein said backing plate is bonded onto said tantalum hydride by mechanical means.

22. The sputter target of claim 15, further comprising an interlayer located between said tantalum hydride or niobium hydride and said backing plate.

5 23. The method of claim 1, wherein said backing plate comprises a hydridable material which is hydrided during said hydriding.

24. The method of claim 23, wherein said separating comprises gravity separation, flotation, air classification, electrostatic separation, or combinations thereof.

10 25. The method of claim 23, wherein said hydrided backing plate is reduced to powder form.

26. The sputter target of claim 15, wherein said backing plate comprises a hydridable material.

27. The sputter target of claim 15, wherein said backing plate is hydrided.